

calculations







Foundation Design Calculation Package

This Design Calculations Package has been prepared using the latest applicable codes and standards and the latest developments in engineering practices. A design engineer prepared the calculations and a building specialist checked the detailing and drafting.

Computer programs, verified by Salsa Steel Corp. have been used where applicable to determine structural requirements. The output of these programs have been incorporated in this package together with explanation text where necessary.

Please use this calculations package in conjuction with the drawings provided. This design calculation package may be submitted along with the plans for the plan review/permit process.

For any questions regarding this package please do not hesitate to contact our office. Salsa keeps records of reference on design calculations for each building/foundation designed as a part of the *Salsa Total Quality System*.

Project Information

4CCEPTED BY

Project Name: Pemaco Superfund Site

Project Address: Maywood, CA

End Use Of Building: Public Works

Building Dimensions:

49.3 ' Width

81.3 ' Length

12 ' Height

Building Type:

Responsible Party: Sturdi-Quick Prefabricated Structures

324 S. Diamond Bar Blvd., #223

Diamond Bar, CA 91765

Builder Information:

An Wingth The i Associate

Project Control Number

* S S - 0 2 7 9 7 *

SHEET 1

Project Name: Pemaco Superfund Site

Design

Codes and Loads

Governing Code: CBC 2001

Seismic Zone (Coefficient):

Wind Pressure: 80 mph
Closed/Open: Closed
Exposure: C

Soil Profile: Sd Snow Load: (Pg =) 12

Frost Depth: 0"

Design Stresses

Soil Pressure: 1,500 psf-Vertical

150 psf-Lateral

Concrete: 4,000 psi

Reinforcement: A-615 Grade 40 #4 bars and smaller

Grade 60 #5 bars and larger

A-185 Welded Wire Reinforcement

Concrete Masonry Units: F'm = 1,500 psi (Prism Test Record)

Misc. Steel: F'y = 36 ksi

Welds: E-70 Electrodes 21 kli

Foundation

Slab Thickness: 10 "

Slab Reinforcement Type: Rebar Slab Reinforcement Size: #5

Reinforcement Spacing: 10 " on center each way

Perimeter Footer Type: Load Bearing 12"x12"

Concrete Mix

Portland Cement: 5 Sack Mix

Water: 0.58 Water/Cement Ratio

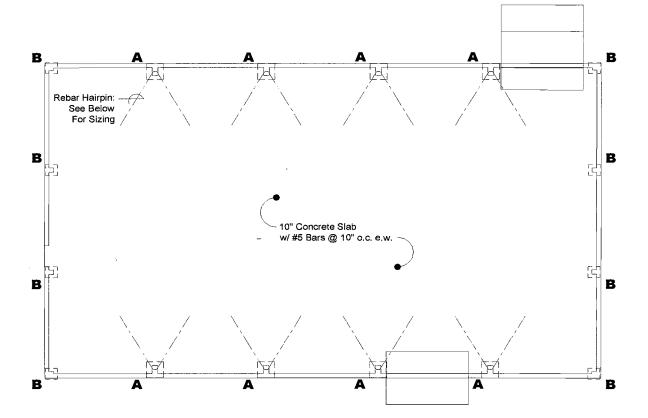
Fine Aggregate: Well Graded

Coarse Aggregate: 3/4 "
Maximum Slump: 4 "

Notes

- 1. All bearing footings shall extend a minimum of 12" into native soil
- 2. Allowable soil bearing capacity shall be computed with 20% increase for each additional foot of depth, unless noted otherwise
- 3. 1/3 increase for short term loadings
- 4. All footings shall be centered below columns, unless noted otherwise.

Building



Check Thrust

$$P_h = 7.20^{K}$$

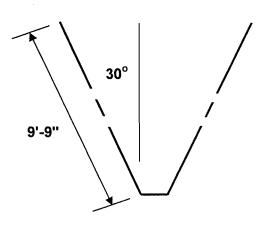
Force Each Side Of Pin

$$F = \frac{7.20}{2(0.866)} = 4.16$$
 k

Size Hairpin

$$A_s = \frac{4.16}{20(4/3)} = 0.1559 \text{ in.}^2$$

Hair Pin Table			
	5'-0"	10'-0"	20'-0''
#4	0.0491	0.0981	0.1963
#5	0.0767	0.1533	0.3066
#6	0.1104	0.2208	0.4416



Use (1) #4 Rebar x 20' Long Hairpin

Slab

Check Slab: Assume No Steel Reinforcement

Slab Thickness = 10.00 "
$$W_{c} = 150 \text{ pcf}$$

$$f_{\dot{c}} = 4,000 \text{ psi}$$

$$f_{t} = 1.6 * \sqrt{4000} * (4/3) = 134.59 \text{ psi}$$

$$S_{m} = 12''(10'')^2/2 = 200 \text{ in}^3$$

$$M_{s} = 125\text{L}^2/2*12 = 750 \text{ in-lbs.}$$

$$t = \frac{M}{S} : L = \sqrt{134.58653721676} = 5.99 \text{ l.f.}$$

Check Slab Reinforcement:

Type: Rebar Diameter 0.6250 0.3066 Size: #5 Spacing: 10 " o.c. Depth Of Reinforcement: 5 " (Mid Depth of Slab) $= 0.368 \text{ in}^2/\text{l.f.}$ $A_{reinf per foot} = 0.307/0.83$ $A_s = \underline{M}$ $= 0.37 = \underbrace{\frac{125L^2}{4000}}_{1.44(4/3)(5'')}$ $\therefore L = \sqrt{32(0.368)(1.44)(1.33)(5'')}$ 10.66 l.f.

5.99 l.f. + 10.66 l.f. = 16.65 linear feet of slab will lift off before it breaks

eFooting

Size Footing-A

A

Column Type Rigid Frame
Quantity 4

Frame Reactions

$$P_v = 13.40^{K}$$
 $P_u = 6.20^{K}$
 $P_b = 7.20^{K}$

Design Criteria

Yes Footing
Yes Slab

Yes Allowable Increase For Width
No Allowable Increase For Depth
Yes Friction

Bracing Reactions

$$P_v$$
= 0.00 ^K Does Not Govern P_u = 0.00 ^K Does Not Govern

Check Footing Size 2.50 'sq. x 1.00 'deep

Allowable Soil Bearing=
$$q = [1500 [1 + (.2) * 2.5]] = 2,250 p.s.f.$$

Soil Friction= $\mu = 2250 / (2.5 * 3) = 300 p.s.f.$

Max Loads From Calcs

Check Bearing Capacity

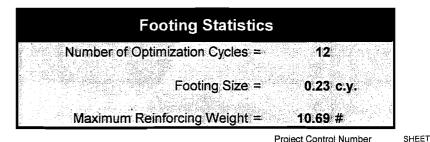
Actual Soil Bearing=
$$q_{act} = \frac{13.40}{(2.5)^2}$$
 = 2,144 < 2,250 OK

Check Reinforcement

$$P_{min}$$
= 0.0018 Req. A_s Total A_s
 A_s = 0.0018 * (30) * (12)= 0.648 < 0.785 OK

Use 2'-6" sq. x 1'-0" ft. deep Concrete Footing, With (4) #4 bars each way.

...No Warnings!



Project Control Number

eFooting

Size Footing-B

Column Type Endwall Column Quantity

Frame Reactions

$$P_v = 4.50^{K}$$
 $P_u = 3.60^{K}$
 $P_b = 0.00^{K}$

Max Loads From Calcs

Design Criteria

Yes Footing

Yes Slab

Yes Allowable Increase For Width

No Allowable Increase For Depth

Yes Friction

Bracing Reactions

$$P_v$$
= 0.00 ^K Does Not Govern P_u = 0.00 ^K Does Not Govern

1.75 'sq. x 1.00 'deep **Check Footing Size**

Allowable Soil Bearing=
$$q = [1500 [1 + (.2) * 1.75]] = 2,025 p.s.f.$$

Soil Friction= $\mu = 2025 / (1.75 * 3) = 386 p.s.f.$

Check Bearing Capacity

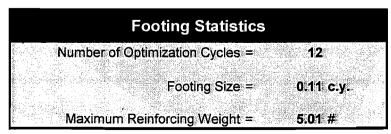
Actual Soil Bearing=
$$q_{act} = \frac{4.50}{(1.75)^2}$$
 = 1,469 < 2,025 OK

Check Reinforcement

$$P_{min}$$
= 0.0018 Req. A_s Total A_s
A_s= 0.0018 * (21) * (12)= 0.454 < 0.589 OK

Use 1'-9" sq. x 1'-0" ft. deep Concrete Footing, With (3) #4 bars each way .

...No Warnings!



Pemaco Superfund Site Project Name:

AnchorBolt

Check Anchor Bolt Embeddment

· Note:

Anchor bolt diameter and quantity has been determined by Building Manufacturer.

Check for embeddment length and bolt type.

Check 3/4"
$$\phi$$
 A307 Headed Bolt or A36 Threaded Rod Quantity 4

$$P_u = 6.20^{K}$$

$$L_e = 12 "$$

$$D_e = 4 "$$

$$C_{es} = 0.333$$

$$F_{c} = 4,000 \text{ p.s.f.}$$
F.S.= 4

$$\phi$$
 Pc=0.65 [$\sqrt{2}$ (3.14) (12) (12 + 1.5)] (2.8) (1) $\sqrt{4000}$ (0.334) = 27,602 # 27,602 / 4 = 6,900 # per bolt ... 1 Bolt Effective

Use (4) 3/4"A307 Headed Bolt or A36 Threaded Rod With 12" Min. Embeddment and 3" Projection W/3" sq. x 3/8" Plate Washer

